Wildlife Report 2017

Fungi

Tony Leech

It says much for the increasing expertise of mycologists in Norfolk that some 27 taxa of fungi were added to the Norfolk list in 2017. Many were micro-fungi but just over half were macro species.

Small, brown, but new to Britain

The brittlestems (*Psathyrella* spp.) are small to medium-sized agarics with drab colours. Only a handful of the 98 British species can easily be recognised in the field or from illustrations. When Yvonne Mynett found a single brittlestem on dead Common Reed *Phragmites australis* leaves in shallow water at Watermill Broad, Cranwich (TL7795) on 18 February 2017, she noticed that it had faint pink edges to the gills. Not many psathyrellas show this feature and, together with the habitat, this enabled her to propose that it might be *Psathyrella almerensis* (using the key in *Funga Nordica* (Knudsen & Westerholt 2012)). She sent material to Kew where Alick Henrici concurred (Henrici 2017) but pointed out that it was now considered conspecific with *P. thujina* (found in North America) and that the latter name has precedence.

A painting of *Psathyrella thujina* by Geoffrey Kibby, based on images of foreign specimens.

***P. thujina* at Hickling, October 2018.** *Yvonne Mynett*

P. thujina is widely distributed, but apparently very rare, in Western Europe, known only from one or two sites in a few countries (Holland, Germany, Italy) but not hitherto from Britain. Not only the pink gill-edges, probably not always present, but also the presence of pleurocystidia (sterile cells on the gill face) distinguish it from the commoner *P. typhae* which also grows on dead reeds but usually on their stems. Yvonne has very recently (October 2018) also found *P. thujina* at Hickling.

The reedbeds in which *P. thujina* was found fringe a cluster of disused gravel pits. The whole site has yielded well over 200 species of fungi, and in 2013 the tiny inkcap *Coprinellus kubickae* was found there, also on reed stems, at only its second British site. Henrici (2017) offered the advice that "to find under-recorded species concentrate on under-researched habitats at unpromising times of year!"

I am grateful to Geoffrey Kibby for permission to reproduce his painting.

An alien appears

On 5 March 2017, John Alban was puzzled by a number of white cage-like structures which had appeared on his garden lawn, west of Norwich. By searching on-line he tentatively identified these as the Basket Fungus *Ileodictyon cibarium* and informed the mycological community. During the

***Ileodictyon cibarium*, Hethersett. September 2017.** *John Alban*

following week a further 16 appeared in an area approximately 2.8 x 1.3 metres near to a Lilac *Syringa vulgaris* bush. The house had been built 20 years earlier and the lawn laid on poorly drained soil. In September 2017 a second fruiting of four 'cages', one 120 mm across, appeared on the same lawn .

I. cibarium belongs to the Phallaceae, a family in which development takes place inside an 'egg' from which emerges a receptacle, often cage-like or with arms (Kibby 2016). Some part of this structure is coated in slime which contains spores that are dispersed by insects attracted by the smell; distinctly carrion-like in the Norfolk collection. Many members of the family are tropical or subtropicphotol, and only Stinkhorn *Phallus impudicus* and Dog Stinkhorn *Mutinus caninus* are common in Britain. *Ileodictyon* forms an open cage-like structure which literally springs out of its egg from which it detaches and is then able to roll around.

The pattern of occurrence of the Basket Fungus *I. cibarium* in Britain is almost as strange as the fungus itself. This fungus, which is widespread in New Zealand (and occurs in Australia and Chile), was first recorded in Britain in 1954 in a West London garden (Reid & Dring 1964) where it continued to fruit for at least 30 years. By 1985 it had occurred in a further three locations, each no more than 5 km from its nearest site (Reid, 1985). In 1984 it occurred near Ipswich, Suffolk, and in late 2017 appeared in some numbers at Landguard, Felixstowe (Neil Mahler, pers. comm.). The fungus has also occurred in a greenhouse at the University of Sheffield. The assumption is that these British appearances represent occasional introductions with local dispersal.

The initial excitement was heightened by the realisation that with its relatively small size and smooth, thin arms the Norfolk specimen could be *I. gracile* which occurs in Australia and has not been recorded in Britain. Both are described and illustrated by Dring (1980). In the key appended to that paper (written by R.W.G. Dennis) the species are separated by *I. cibarium* not being thickened at the intersections and at first marked by concertina-like creases, and *I. gracile* being thickened at the intersections and not marked with concertina-like creases**.** No less-vague discriminating characters were offered. At first, this possible identification was shared by mycologists at Kew Gardens but their DNA investigations revealed a sequence identical to that published for *I. cibarium*. We are not, however, aware of any published sequences for *I. gracile* so it is not impossible that they are actually one and the same species.

March would not seem to be the most propitious month in which to produce insect-dispersed spores but the eleven dated and separate records on the Fungus Record Database of the British Isles (www.fieldmycology.net) are all, apart from one in July, from between October and March. This may not be surprising for a fungus 'in the wrong hemisphere' but analysis of 123 records in New Zealand (http://naturewatch.org.nz/taxa/382779-Ileodictyon-cibarium) shows that most records there are made between April and September with a peak in June – mid-winter in New Zealand!

A close relationship on the dunes

In 2009, and again in 2011, a small, orange-brown *Cortinarius* species (webcap) was

***Cortinarius pratensis* growing close to Sand Sedge *Carex arenaria*, Blakeney Point 2011.** *Tony Leech*

found widely on fixed dunes on Blakeney Point TG0046 (Leech 2014). Webcaps in this group are notoriously difficult to name but the species was tentatively identified as *Cortinarius pratensis*, despite the very young gills being deep yellow rather than orange. This species had been recorded from Scotland, Wales and the Republic of Ireland but not, until now, from England.

All *Cortinarius* species have hitherto been considered to form mycorrhizal associations with woody vascular plants. These form to the mutual benefit of the fungus, which receives sugars from the plant, and the plant, which receives minerals from the fungus. However, no woody plants were present anywhere near the fungi on the dunes. In 2009, Peter Roberts reported that he had found what he identified as *C. pratensis* with *Carex flacca* in grassland in Glamorganshire, again away from trees.

In 2002, Harrington & Mitchell had established, on the basis of morphological evidence and DNA studies, that *Cortinarius cinnamomeus* (very close to *C. pratensis*) was mycorrhizal with both Glaucous Sedge *Carex flacca* and Pill Sedge *Carex pilulifera* on The Burren in western Ireland. The suspicion arose, therefore, that the Blakeney Cortinarius might be forming an ectomycorrhizal association with Sand Sedge *Carex arenaria*.

Subsequently, in October 2014, Philip Amies collected an identical Cortinarius species on sand dunes at Holme (TF7144). At my suggestion, he returned to collect rhizomes from adjacent Sand Sedge plants and we supplied both to Anne Edwards at the John Innes Centre, Norwich who kindly determined the nucleotide sequence of DNA in the IRS barcode region of the fungus, and found exactly the same sequence in the sedge rhizomes (Edwards & Leech 2017). This showed beyond reasonable doubt that fungal tissue existed within the sedge. The most likely explanation is that the two organisms had formed an ectomycorrhizal association

DNA barcode sequences can be used to identify fungi (and other organisms) provided that they can be linked to an authoritatively identified specimen. Strictly, this should be the type specimen on which the name is based. Through the good offices of Tuula Niskanen (Jodrell Laboratory, Kew) I was able to contact

Jean-Michel Bellanger (French Institute of Health and Medical Research, Paris) who had sequenced the type of *C. pratensis* in 2016. The base sequences of this and the Blakeney Point fungi were identical, establishing that the fungus involved was, indeed, *C. pratensis*. Interestingly, the sequence was exactly the same also as the fungus implicated in the Irish study showing that that, too, was actually *C. pratensis*. The base sequence of the Holme dunes fungi (and found in the associated sedge) differed at three points but as these were near the end of the sequence they were not considered to indicate that this was not, too, *C. pratensis* (Bellanger pers. comm.).

The cooperation of a large number of people in several countries established for the first time that *C. pratensis* occurs in England and that it forms a mycorrhizal association with Sand Sedge.

I thank Anne Edwards for all the sequencing work. The initial determinations were carried out under her direction at the John Innes Centre, Norwich, by visiting school students during a practical session of the Year 10 Science Camp, an educational outreach scheme which provides an experience of life as a scientist at Norwich Bioscience Institutes. Funding for the scheme was provided by the John Innes Centre, The Institute of Food Research, The Genome Analysis Centre and The Sainsbury Laboratory. I thank, too, Philip Amies for collecting material from the dunes at Holme.

I am very grateful to Alick Henrici (Kew), Klaus Høiland (Oslo), Jean-Michel Bellanger (Paris) and, especially, to Tuula Niskanen (Kew) for their helpful comments and additional information.

Inland stalkballs

The Winter Stalkball *Tulostoma brumale* is the most widespread of four British *Tulostoma* species but is far from common. Its spore-sac resembles a rabbit dropping in size and colour and is born on a stiff stalk

Winter Stalkball *Tulostoma brumale*, Watermill Broad,Cranwich, Nov 2018. *Dave Horsley.*

a few centimetres long, often buried in sand. Most of the Norfolk records are from dunes between Heacham and Holkham but mid-19th century records from both Norwich and King's Lynn refer to it on 'wall tops' – presumably on sandy mortar. In November 2016, Alex Prendergast recorded it on Brettenham Heath (TL98) but the most surprising record was made by Jo Parmenter with the Norfolk Flora Group on a roadside verge in Sprowston (TG255124) on 20 November 2017 where it was growing on mossy ground with rubble. Just a week later, two fruitbodies were photographed by Dave Horsley at Watermill Broad, Cranwich (TL778955), on a grassy track crossing a disused gravel-pit site last worked over 25 years ago.

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Table 1. New county fungus records in 2017, in addition to those given in the text.

Species	Place	Date	Recorder [Identifier]	Notes
Cantharellus tubaeformis var. *pallida*	Bacton Woods TG3131	25.11.2017	Neil Mahler [Tony Leech]	This variety not recognised on FRDBI. *C. tubaeformis* previously recorded in Norfolk.
Cercospora mercurialis	Thursford NWT TF9833	8.5.2017	Richard Linford [Tony Leech]	Micro-fungus on *Mercurialis perennis.*
Ceuthospora feurichii	Sisland TM3498	14.12.2016	Robert Maidstone	Micro-fungus on *Vinca minor* leaves; very few British records.
Coprinopsis laanii	Bayfield (Glandford) TG0440	19.10.2017	Anne Harrap [Tony Leech]	Inkcap on deciduous log.
Coprinopsis patouillardii	Swangey Fen TM0193	20.5.2017	Tony Leech	Inkcap on heap of fen arisings.
Coprotus aurora	Barney Wood TF9832	18.3.2017	Mark Joy [Tony Leech]	Disco on deer dung; very few British records.
Episphaeria fraxinicola	Martham TG4518	4.3.2017	Yvonne Mynett	Cyphelloid on dead *Hydrangea* stem.
Erysiphe lycopsidis	Bodham TG1240	12.4.2017	Tony Leech	Powdery mildew on *Anchusa arvensis.*
Helicogonium sp.	Wheatfen TG3205	18.7.2017	Tony Leech	Parasite on *Mollisia hydrophila* on *Phragmites.*
Inocybe aghardii	Cranwich TL7795	June 2017	Tony Leech	In grass under *Salix*. First seen 13.9.2015.
Lactarius acerrimus Two-spored Milkcap	Sculthorpe Moor TF9030	16.8.2017	Foray [Tony Leech]	*Large milkcap in hedgerow under Quercus.*
Lasiobolus macrotrichus	Barney Wood TF9832	18.3.2017	Mark Joy [Tony Leech]	Disco on deer dung.
Laxitextum bicolor	Felbrigg TG1940	25.10.2017	Anne Crotty	Small brown, tiered bracket on *Fagus* stump.
Mycena luteovariegata	Blickling TG1628	2.11.2017	Tony Leech (foray)	Formerly *M. pura* var. *lutea.*
Paxillus obscuriformis	Holt TG0838	27.9.2017	June Hulbert [Tony Leech]	Large rollrim on grass verge under *Betula.*
Phaeogalera stagnina	Dersingham Common TF6829	5.8.2017	Yvonne Mynett	Small brown agaric on soil.
Ramaria curta	Bergh Apton TM3099	22.10.2017	Tony Leech (BACT foray)	A coral fungus. Seen previously here.
Ramariopsis crocea	Earlham Cemetery TG2108	Oct. 2017	Ian Senior	In mown grass.
Scutellinia kerguelensis	Wheatfen TG3205	29.10.2017	Neil Mahler [Tony Leech]	Small orange discomycete on wet wood.
Septoria galeopsidis	Sculthorpe Moor TF8930	18.7.2017	Mary Hamilton [Tony Leech]	Micro-fungus on *Galeopsis tetrahit* leaf; very few British records.
Septoriella junci	Cranwich TL7795	17.5.2017	Tony Leech	Spots on standing dead Juncus inflexus.
Stagonospora atriplicis	Cley TG0544	23.7.2017	Tony Leech	On living leaves of *Atriplex prostrata.*
Thecotheus granulosus	Ringstead Downs TF7039	29.3.2017	Mark Joy [Mike Richardson]	Small discomycete on cow dung. Probably synonymous with *T. crustaceus* (MJW).
Typhula trifolii	Bayfield (Glandford) TG0440	5.11.2017	Stuart Wright [Tony Leech]	On dead *Gunnera* stems. Some branched.

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***Paxillus obscuriformis*, Holt, Sept. 2017.** *Tony Leech*

***Ramariopsis crocea*, Earlham Cemetery, Oct 2017.** *Ian Senior*

Fungi first recorded in Norfolk during 2017

***Thecotheus granulosus* on cow dung, Ringstead Downs, March 2017.** *Mark Joy*

***Lasiobolus macrotrichus* on deer dung, Barney Wood, March 2017.** *Mark Joy*